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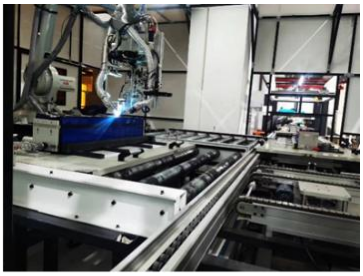


Microgrid EMS Introduction

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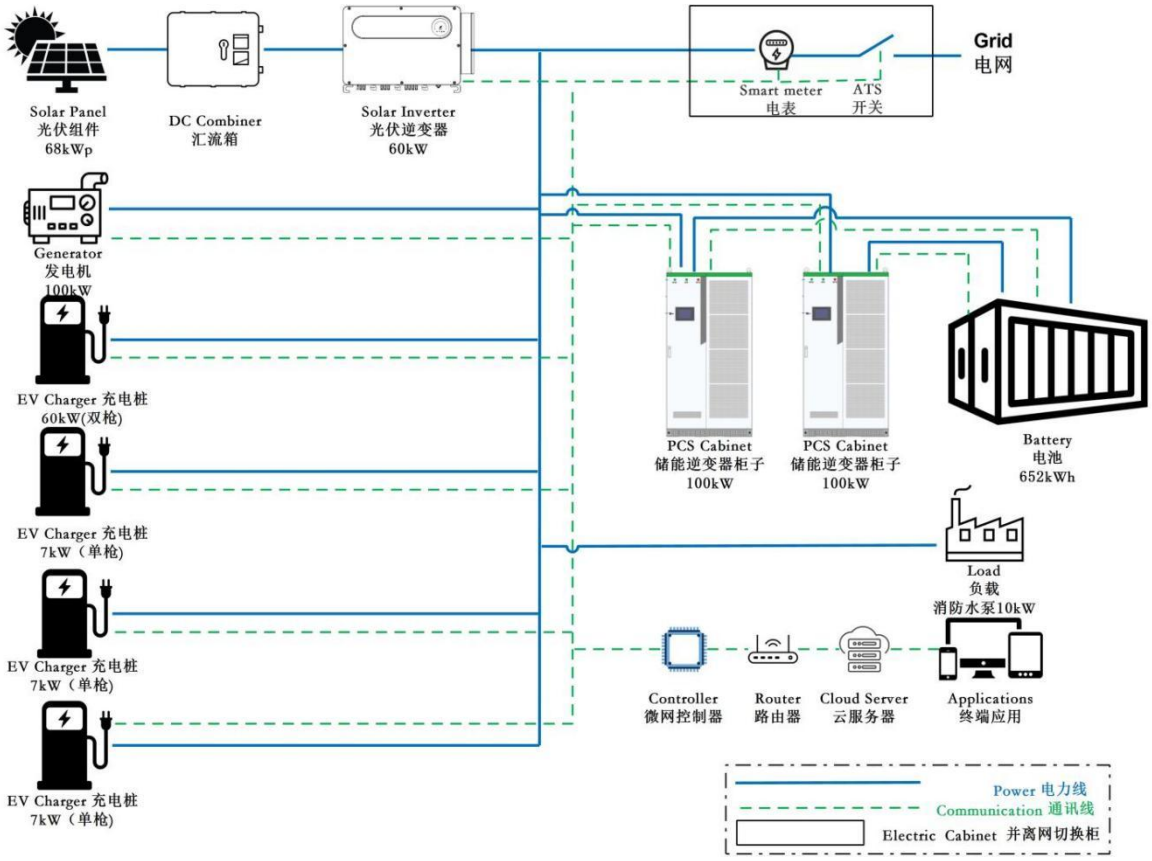
1.1 Table of Content

1 Technical Solution

1.1 Microgrid System

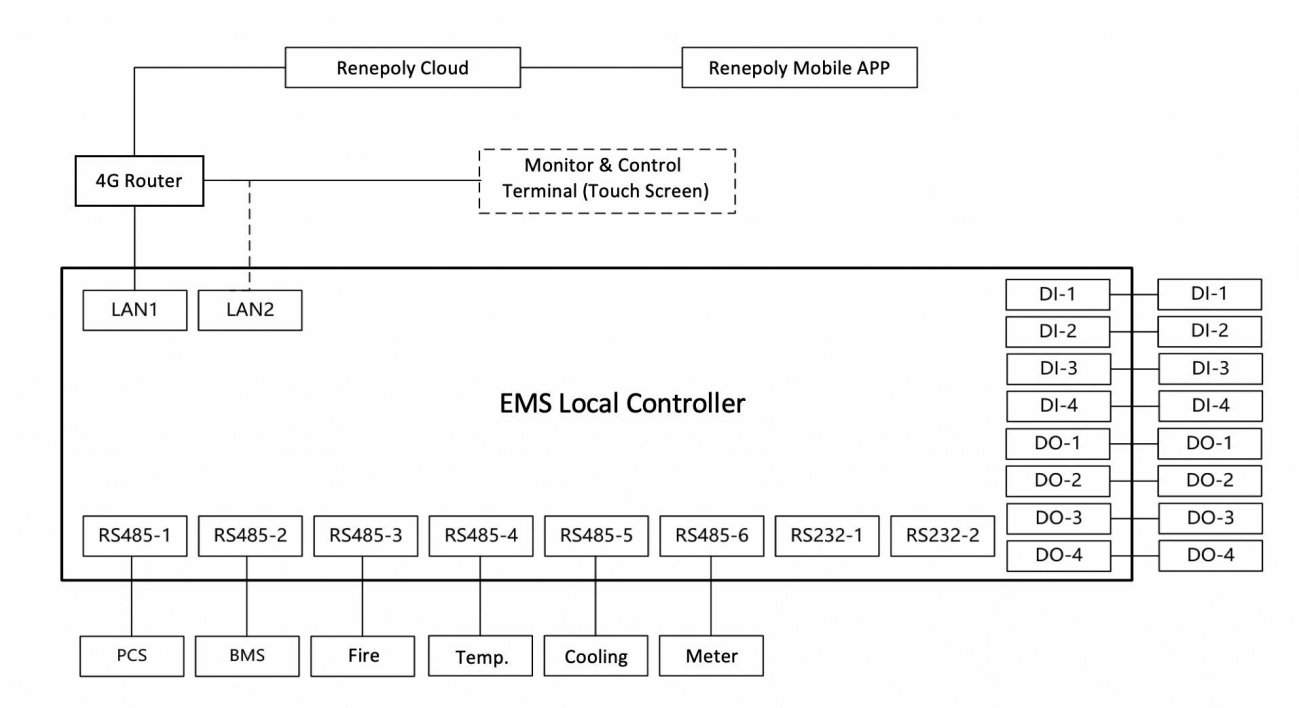
An example microgrid system design diagram is shown in the figure below.



1.2 Renepoly EMS Introduction

Renepoly Cloud is an energy management system and cloud platform developed specifically for microgrids. Its hardware includes EMS local controller, EMS local display and control terminal, and 4G router device; its software includes microgrid management program deployed locally on EMS local controller, EMS cloud platform deployed on remote server, and mobile APP. The full set of Renepoly EMS products ensures the normal operation of microgrid system and meets the real-time monitoring of microgrid by operation and maintenance personnel anytime and anywhere.

1.3 EMS Wiring Diagram



1.4 Standards

1. "IEC 801.2 Standard Part 2 - Electrostatic Discharge Standard" (IEC 801.2)

2. "Software Development Specification" (ISO9001-2000)

3. "Electromagnetic Compatibility Standard for Industrial Process Measurement and Control" (NFC 46-022)

4. "Technical Requirements for Computer Sites" (GBJ45-82)

5. "Technical Specification for Monitoring System of Electrochemical Energy Storage Power Station" (NB_T 42090-2016)

6. "Technical Specification for Remote Centralized Monitoring of Distributed Energy Storage System" (T/CEC 174-2018)

7. "Basic and Safety Rules for Human-Machine Interface Signs and Identification - Marking of Equipment Terminals, Conductor Terminals and Conductors" GB/T 4026-2019

8. "Operation and Maintenance Procedures for Energy Storage Power Station" (GB/T 40090-2021)

1.5 Communication Points

- PCS and EMS communicate via Ethernet interface using Modbus/TCP, IEC104 or IEC61850 protocol;
- BMS and EMS communicate via Ethernet interface using Modbus/TCP, IEC104 or IEC61850 protocol;
- EMU and EMS communicate via Ethernet interface using Modbus/TCP, IEC104 or IEC61850 protocol;
- The meter and EMS communicate via RS485 serial port using Modbus RTU or DL/T 645-1997/2007 protocol;
- The diesel generator and EMS communicate via RS485 serial port using Modbus RTU or the manufacturer's private protocol;

The above equipment provides the corresponding communication protocol of the communication protocol supported by the equipment. Equipment and supported communication protocol are not limited to above examples.

1.6 EMS Functions

1) Data collection and monitoring

The EMS energy management system can monitor the data information of site equipment (including PCS, BMS, battery cells, electric meters, loads, gas turbines, etc.) in real time, display it in the monitoring screen, and store it in the database.

Analog quantity measurement: collect and process the voltage, current, active power, reactive power, frequency, power factor, etc. of the main equipment of all controlled stations.

State quantity measurement: equipment operation alarm signal, etc.

2) Data processing and analysis function

The EMS system can realize simple processing of data information. Telesignal processing includes: telesignal signal inversion and telesignal signal displacement. It can automatically identify the accident displacement according to the total accident signal and protection signal.

Analysis and statistics functions include daily charge and discharge calculation of energy storage system, total charge and discharge calculation, total power addition, power factor, load rate calculation, etc.

Analyze and statistically analyze the voltage, temperature, SOC and other information of single battery and battery cluster, and display them in the form of curves, bar charts, etc.

3) Operation control function

The EMS system realizes real-time control of energy storage charging and discharging power, demand, liquid cooling air conditioner on/off, etc. according to the needs of strategic operation. Ensure the stable, efficient and safe operation of the entire site.

4) Event alarm function

The EMS system provides an open intelligent event alarm function. According to the level of event alarm, alarms are generated and saved according to type and level.

Event alarms are divided into program operation alarms, telemetry alarms, telesignaling alarms, communication fault alarms, and user operation alarms according to type; they can be divided into ordinary alarms, important alarms, and emergency alarms according to level.

5) Graphic display

The graphic system is based on relational databases and multimedia technology to realize rich graphic data display, and supports convenient operations such as full graphic human-computer conversation interface, navigation diagram, structure diagram, curve diagram, bar diagram, mixed diagram, working condition diagram, table, etc. It can display screens such as main wiring diagram, equipment monitoring diagram, operation report, energy control, communication status, etc., and can quickly call up the screen through keyboard, mouse, etc.

The graphics system supports the simultaneous display of real-time data, historical data, etc. on one screen, and the screen data can be flexibly configured and freely combined by users.

At the same time, the rich dynamic graphic element controls of the graphics system can dynamically display the energy storage percentage capacity, display the power flow direction, and display the two-level telemetry limit in different colors. Telemetering information such as equipment status and operation mode can be directly displayed in dynamic text information, making the screen simpler and clearer.

All historical data in the background can be displayed and historically reviewed with hours as the horizontal axis and minutes as the interval, and the historical storage time is greater than 1 year.

The data can also be displayed in the form of a report to show the data required by the customer. It can display power data in units of days, such as daily charge and discharge.

6) User authority setting function

Users can set PCS and BMS working parameters according to current needs and set working parameters according to system operating conditions and environmental conditions. Different users log in and set parameters according to different permissions.

7) Data forwarding function

It can realize communication with the owner's backend system, and use the agreed protocol to send the data information of the energy management system platform to the owner's backend.

8) SOC maintenance control

Real-time monitoring of energy storage SOC and charging and discharging power to keep the energy storage battery SOC within a reasonable range.

9) Smooth and stable control

The system realizes real-time control of distributed power generation power, energy storage charging and discharging power, load, etc. according to the needs of strategy operation. Ensure the stable, efficient and safe operation of the entire site.

Power generation side - real-time monitoring of power generation, by controlling the charging and discharging of energy storage batteries, or controlling the power generation output of other energy generation forms to reduce the sudden change of distributed power output, so that the distributed power output is smooth;

Grid side - real-time monitoring of grid output power, by controlling the charging and discharging of energy storage batteries, control the grid output power;

User side - real-time monitoring of user power consumption, by controlling the charging and discharging of energy storage batteries, realize the peak shaving and valley filling of user power consumption curve, and realize economic operation.

10) Planned operation mode

With a resolution of five minutes, set the all-day charging and discharging strategy to enable users to achieve peak and valley price difference benefits, and support multiple plan curve switching.

11) On-grid and off-grid switching control

The system detects the switch status of the grid connection point and the on-grid and off-grid status sent by the equipment, determines the current on-grid and off-grid status of the system, and automatically switches the on-grid and off-grid control strategy.

12) Demand management control function

Real-time monitoring of the power value of the system grid connection point, by adjusting the charging and discharging power of the energy storage system, effectively controlling the grid connection point power within the set range. According to the policies of different regions, through demand electricity fee management and demand-side management, help users reduce demand electricity fees and electricity fees, and obtain additional profit points.

13) System protection function

EMS is a key subsystem for the execution of protection strategies of the energy storage system, monitoring BMS, PCS, fire protection and energy meters and other equipment. EMS receives fault information from BMS and PCS. EMS monitors fire protection and energy meters, etc. EMS monitors these equipment fault information and equipment signal fault information, controls the system to standby or shut down, and ensures the safe and reliable normal operation of the system.

14) Auxiliary black start function

By starting the generator sets with self-starting capability in the system, the generator sets without self-starting capability can be driven, gradually expanding the system recovery range and eventually achieving the recovery of the entire system.

1.7 EMS Local Controller

The EMS local controller is a rail-mounted embedded communication management machine (on-site controller). The device has rich interfaces and extremely low power consumption. It has 6 RS485 interfaces, 2 RS232 interfaces, 2 10/100/1000Mbps adaptive network ports, 4 DIs, and 4 DOs. It can provide users with powerful computing power and flexible and diverse communication modes. It can be used to complete data communication between multiple intelligent devices and is suitable for photovoltaic secondary communication, energy storage on-site energy coordination control and other scenarios.

The communication functions include: acquisition function, supporting common communication protocols such as Modbus RTU, Modbus/TCP, IEC104 master station protocol, serial port 103 protocol, etc., which can meet the communication access of various intelligent devices; forwarding function, supporting common communication protocols such as IEC104 slave station protocol, serial port 101 protocol, Modbus/TCP server protocol, etc., which can meet the data forwarding function of multiple scenarios.

1.8 Product Features

a) Main system:

CPU: Industrial-grade ARM9 embedded microprocessor, 400MHz

RAM: 128MB DDR2 SDRAM

Flash: 256MB NAND Flash

Communication program: SKCE1000

b) Network interface:

LAN: 2 10/100/1000Mbps adaptive industrial Ethernet, standard RJ45

Interface isolation protection: 15KV air discharge and 8KV contact discharge protection

c) Serial interface:

User serial port: 6 RS485 serial ports, 2 RS232 serial ports

Serial port protection: All signals provide 15KV ESD

d) Mechanical properties:

Casing: Aluminum alloy, vertical appearance

Weight: 800g

Dimensions: 55 × 105 × 135 mm Installation method: Guide rail installation

e) Working environment:

Working temperature: -40~80 ℃

Working humidity: 5~95% RH

Storage temperature: -50~100 ℃

f) Power supply:

Power input: 9~30 VDC

System power consumption: 250mA@12VDC, 3W

g) Reliability:

Watchdog: Hardware watchdog (WDT) monitoring

Mean time between failures MTBF: more than 100,000 hours

1.9 Control Logics

1) Peak-valley arbitrage operation

The EMS system can use the transformer surplus capacity to charge the energy storage battery at a cheaper valley electricity price when the load is low; when the load is peak, the energy storage battery supplies power to the load to achieve peak load transfer and obtain higher economic benefits from the peak-valley electricity price.

Dispatching process logic: When the occurrence time of system peak load and valley load is known, the energy storage system is controlled to discharge during the peak load period and to charge during the valley load period.

1. Set the plan curve according to the peak and valley periods;

2. Put into the plan curve mode, and distribute and send the charge and discharge instructions set by the plan curve to control the PCS charge and discharge;

3. When the demand of the corresponding metering point is detected to reach or fall below the set value during the charge and discharge process, adjust the charge and discharge power to meet the demand control requirements;

4. During the charging process: detect whether the SOC reaches the SOC upper limit setting value (default 90%, the maximum can be set to 100%), if it reaches, stop charging; at the same time monitor whether the BMS is faulty, if there is a fault, stop charging the faulty PCS, and other normal PCS will not be affected;

5. During the discharge process: detect whether the SOC reaches the SOC lower limit setting value (default 10%, the minimum can be set to 0%), if it reaches, stop discharging; at the same time monitor whether the BMS is faulty, if there is a fault, stop discharging the faulty PCS, and other normal PCS will not be affected.

According to actual investigation, the peak and valley electricity price time periods in different months in the location of this project are different. Therefore, two sets of peak and valley arbitrage operation strategies are customized throughout the year according to the actual situation of the project to meet the actual operation needs. If the peak and valley electricity price time period changes during the later operation, the user can reset the operation strategy independently.

Peak and valley arbitrage operation strategy:

The calculation method of daily income is as follows

The first charge and discharge income of the day = peak period electricity price × discharge power - valley period electricity price × charging power consumption;

The second charge and discharge income of the day = peak/peak period electricity price × discharge power - valley period electricity price × charging power consumption;

The total charge and discharge income of the day = the first charge and discharge income + the second charge and discharge income.

2) Maximum demand control strategy

The EMS system can monitor the real-time power of the low-voltage side of the user's transformer. When the real-time power exceeds the demand, the EMS system controls the energy storage battery to automatically start discharging or increase the discharge power and monitor the real-time power, reduce

the transformer output, and ensure that the transformer power does not exceed the limit. Thereby reducing the user's demand electricity fee and reducing the user's electricity cost.

The EMS system monitors the maximum demand value of the access point in real time, and controls the charging and discharging power of the energy storage system according to the real-time data monitored to ensure that the overall load power consumption does not exceed the maximum demand of the user.

The EMS system detects the load power consumption data of the user and the grid metering point in real time, records the maximum load value of the point when the energy storage system is in standby or discharging state, and uses this value as the current maximum demand control value, which is updated monthly and replaced when it is higher than this value. The energy management system controls the charging power of the energy storage system according to the real-time data of the point and the collected maximum demand value, so that the sum of the user load and the charging power of the energy storage system is less than the current maximum demand value.

When metering terminal 1> set value (maximum demand value), if the energy storage system is in standby state, the EMS system controls the energy storage system to start power-limited discharge operation; if the energy storage system is in discharge operation state, the EMS system controls to increase the energy storage discharge power; if the energy storage system is in charging operation state, the EMS system controls the energy storage system to reduce the charging power; by controlling the charging and discharging of the energy storage system, the load power at metering terminal 1 is reduced to within the maximum demand value.

When metering terminal 1 is less than the set value (minimum load), if the energy storage system is in standby or charging operation, the energy storage system maintains the existing operation mode; if the energy storage system is in discharge operation, the EMS system controls the energy storage system to reduce the discharge power, and dynamically maintains the load power at metering terminal 1 not exceeding the set maximum demand value.

3) Auxiliary black start control strategy

When this project requires a black start after a power outage, the diesel generator is first started to establish a voltage source. After the voltage stabilizes, the energy storage system is started. The energy storage system works in the grid-connected mode and accepts the power dispatch of the gas turbine system platform. According to the dispatch demand, it outputs power (the upper limit of the output active power is 100kW) to assist the diesel generator in completing the system black start function.

When the user plans to require the energy storage system to assist the diesel generator in black start, the gas turbine system platform switches the energy storage system operation mode from planned curve operation to dispatch operation. At this time, the EMS system only executes the dispatch instructions of the gas turbine system platform, and no longer executes the planned curve instructions until the system ends the black start, and the gas turbine system platform switches the energy storage system operation mode from dispatch operation to planned curve operation.

The gas turbine system platform sends charging instructions in advance according to the current battery capacity of the energy storage system. After receiving the instructions, the EMS system controls the energy storage system to charge. During the charging process, it detects in real time whether the SOC reaches the SOC upper limit setting value (the default is 90%, and the maximum can be set to 100%). If it reaches, charging is stopped; at the same time, it monitors whether the BMS is faulty. If there is a fault, the charging of the faulty PCS is stopped, and other normal PCSs are not affected. Until the energy storage system is charged.

When the diesel generator starts to establish a voltage source and the voltage is stable, the gas turbine system platform sends a power demand instruction to the EMS system. The EMS system controls the power output of the energy storage system according to the power demand instruction, thereby assisting in completing the system black start function.

1. Grid-connected operation

At this time, the generator does not start. When the PCS and photovoltaic inverter detect that the AC side voltage is correct, they are connected to the system as a current source, and the charging and discharging strategy is executed according to the customer's settings;

2. Off-grid operation

All devices in the EMS control system are shut down and enter standby mode. All switches in the primary circuit of the system are disconnected, and the ATS switches to the off-grid state. After waiting for 20 seconds to receive the feedback signal of successful switching, the next step is taken;

During the daytime (the generator cannot be connected), after the EMS controls the generator primary circuit switches to be disconnected, the EMS controls the closing of the PCS primary circuit switch, and sends instructions to let the PCS black start, establish AC voltage, and work as a voltage source. After starting, the EMS detects whether the AC voltage is normal. If it is normal, the EMS closes the PV and

load primary circuit switches. At this time, after the EMS confirms that the photovoltaic and load are working normally, the system is successfully off-grid and enters the daytime off-grid operation mode;

At night or during the day, when there is no photovoltaic, there is no photovoltaic. After that, EMS cuts off the photovoltaic primary circuit switch; EMS synchronously detects the battery power. When the remaining battery power is less than or equal to 30%, EMS controls PCS to shut down and disconnects the primary circuit switch of PCS and load. After confirmation, EMS issues a command to start the generator. After the generator starts and stabilizes, it detects that the voltage in the system is normal, closes the primary circuit load switch and PCS primary circuit switch, and PCS is connected to the power grid (established by the generator) as a current source to perform P/Q control to supply power to the battery and load; after the battery is fully charged, one generator can be cut off, and the remaining generators and energy storage system will supply power to the load together until the battery power is less than 30%, and then restart step 3; After EMS detects that there is power in the grid, all devices in the control system are shut down and enter standby mode, disconnect the primary circuit switch in the system, and ATS switches to the grid-connected state. After waiting for 20S, it detects whether the switch is successful. If successful, it will be executed according to the grid-connected operation mode.

1.10 EMS Local Display and Control

1.10.1 Screen Functions

Function	Description
System Diagram	Display the main wiring diagram of the power station and dynamically display the changes in real-time data of various equipment.
PCS Monitoring	Real-time monitoring of PCS operation data and status
BMS Monitoring	Real-time monitoring of BMS including battery stack/cluster, battery cell data and status
Meter Monitoring	Real-time monitoring of the peak and valley positive and negative power of the electric meter.
Cooling	Real-time monitoring of air conditioning temperature, set point, hysteresis, and

Monitoring	related operating status.
Fire Control Monitoring	Real-time data display of fire protection module.
Others	(The EMS display and control terminal is a configuration screen that can display and draw data based on the actual access data on site, and supports both Chinese and English)

1.10.2 Terminal Parameters

Item		Description
Product Name	TPC1071	Touch Screen
Hardware Parameter	Size	201.8*135.8*40mm
	CPU	Cortex-A53 Quadro-core 1GHz
	Memory	512MB
	LAN	1 RJ45
	Installation	Embedded installation
	Voltage	24±20%VDC
	Humidity	5～90% RH
	Temperature	0～50 ℃
	Memory Environment	-10～60 ℃
	Screen Size	10.1 inches
	Software	

1.11 EMS Cloud

1.11.1 EMS Software Functions (supports Chinese and English)

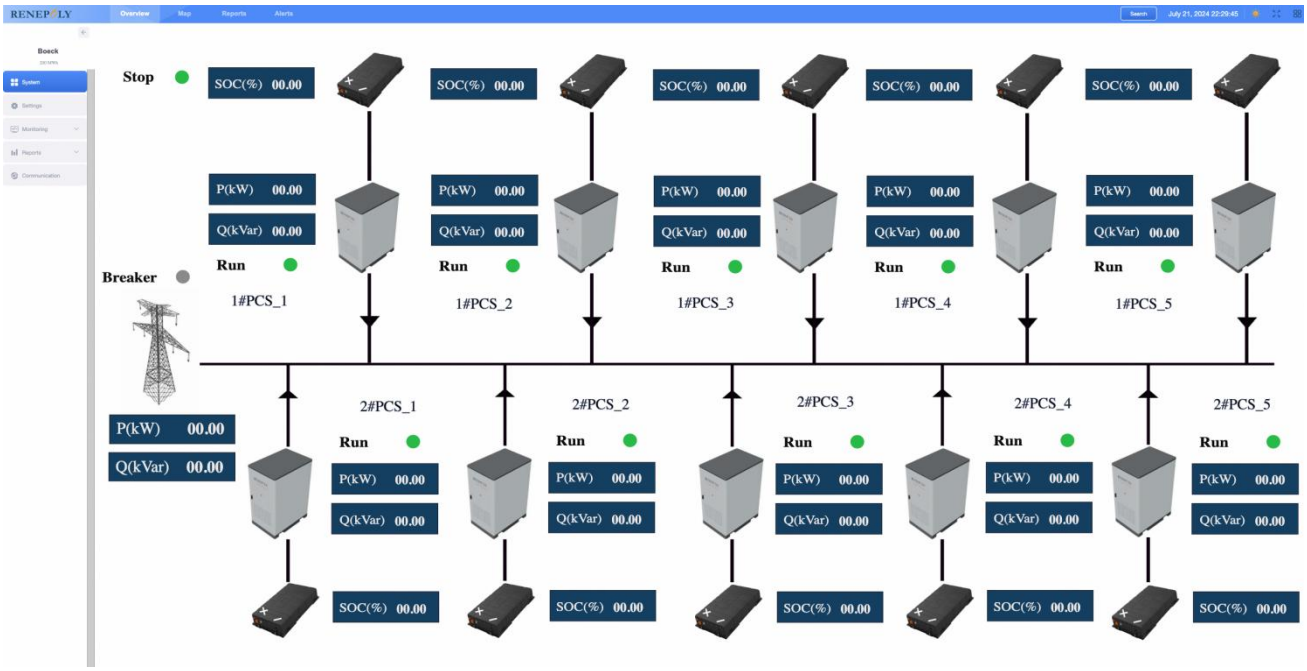
Item	Function Description
Data screen	The overall site information and power, revenue, efficiency and other data are displayed in a large screen format.
Map navigation	The geographical location distribution of the current site is displayed in the form of a map, and you can choose to enter the single-site monitoring (provide map viewing, single-site monitoring and other secondary functions)
Real time operation	The multi-site real-time operation monitoring page can filter sites, and you can choose to view the power station overview data and enter the single-site monitoring (provide multi-site/single-site viewing)
Event Alert	Summarize the alarms of multiple stations (provide real-time/historical query)
Operation Overview	The system operation overview displays the comprehensive real-time data of the power station, using the equipment real-time diagram + basic information + indicator statistics. Overall grasp the comprehensive data information of the power station.
System Overview	Users can view details on the system overview page, basic information, economic indicators, power indicators, SOC change curves, capacity retention rate curves, power revenue indicator statistics bar charts and other related information data.
PCS Monitoring	Each converter can be monitored in real time, and the rated power, model and operating status of the converter, power and electricity price curves, all real-time data and real-time status are monitored. It is easy to find problems in time, provide support for the operation and maintenance of the converter, and improve the working efficiency of the converter.
Battery monitoring	Battery monitoring includes battery stack monitoring, battery cluster monitoring, and single battery (if any) monitoring.
Battery balancing	Each battery stack and battery cluster can be monitored in real time, and the balance between each battery cluster and the balance within each battery cluster can be displayed in the form of a chart.
Fire monitoring	The status of the fire host (started or not started), the status of each battery cluster, and the corresponding values and status can be viewed.

Air conditioning monitoring	The status of each air conditioner (on or off), as well as the corresponding values and status can be viewed.
Power quality	The relevant information values of all meters in the power station can be viewed: power parameters, voltage curves, power curves, power factor curves, and harmonic values.
Historical data	The real-time data of all access devices in the power station can be monitored, and all data and status of telemetry, telesignaling, telepulse, telemetry calculation, and telesignaling calculation of all equipment related to the power station can be monitored.
Query	View the main wiring diagram.
Power station wiring diagram	The statistical report module classifies, summarizes, records, and displays information data. The main functional modules are: daily indicator report, monthly indicator report, annual indicator report, historical data, and historical curves. The main statistical data values are: power indicators, production indicators, and energy conservation and emission reduction.
Statistical report	You can view the interaction between devices and the status of each device. Manage the roles of the platform (provide new/management functions). Users can modify personal information and passwords.
Communication network	The overall site information and power, revenue, efficiency and other data are displayed in a large screen format.
Employee management	The geographical location distribution of the current site is displayed in the form of a map, and you can choose to enter the single-site monitoring (provide map viewing, single-site monitoring and other secondary functions)

1.11.2 Cloud Platform

Microgrid overview page:

The overview page displays the real-time status of the main equipment and loads of the microgrid (including photovoltaic, energy storage, charging piles, diesel generators, load water pumps, etc.). When any equipment has an abnormal situation, the system will display the alarm information in real time and highlight the relevant equipment through color changes (such as red warning).



Operation settings page: The microgrid supports three operation modes: manual mode, automatic mode, and proxy mode.

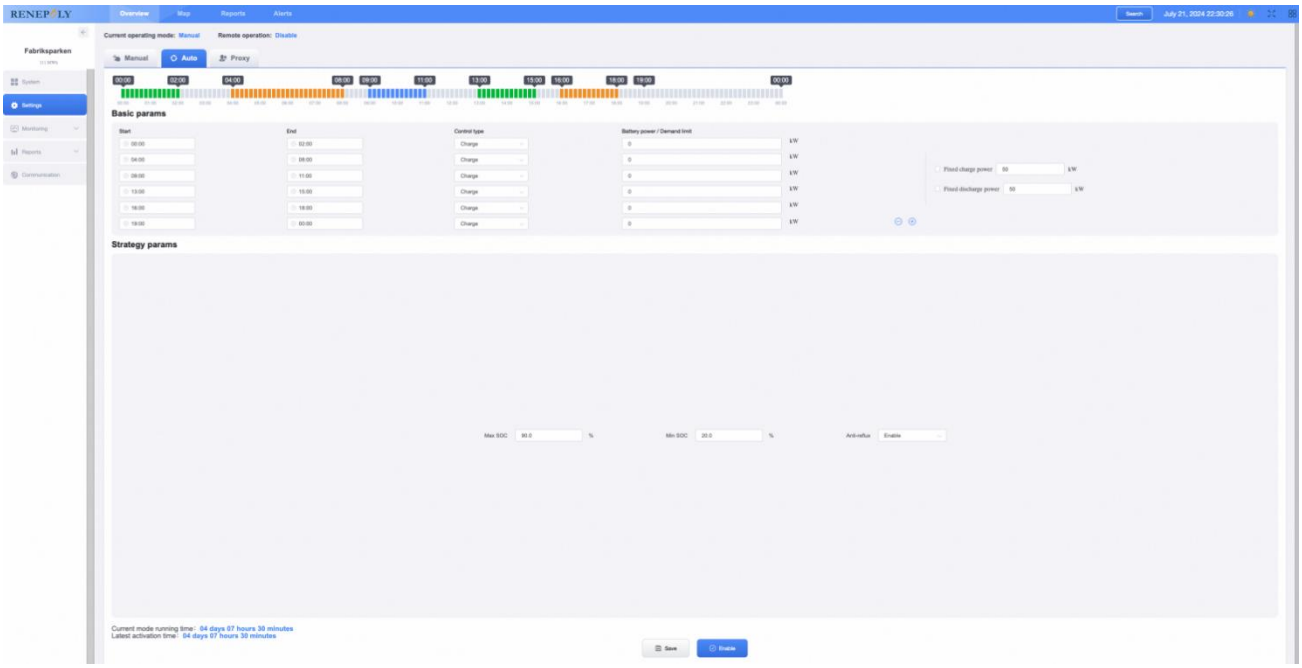
1. **Manual mode:** This mode is mainly used for operation and maintenance personnel to perform manual operation and maintenance of the system. In manual mode, the operation and maintenance personnel can directly control the operation status and operation of the microgrid, including equipment start and stop, parameter adjustment, etc. Operation in this mode requires professional knowledge and experience to ensure the stability and safety of the system. Users can manually start auxiliary black start, grid-connected and off-grid switching and other functions.

2. **Automatic mode:** In automatic mode, the microgrid system can automatically operate and adjust according to pre-set parameters and logic. The system will monitor various operating parameters in real time, such as voltage, current, load, etc., and automatically optimize and adjust according to the set rules. Users can preset operation templates and set planning curves according to information such as time and electricity price, and the microgrid system will automatically operate according to the operation template. In addition, users can set parameters such as the

upper and lower limits of energy storage SOC, the maximum power of PCS, and the maximum power of transformers to meet different operation strategies.

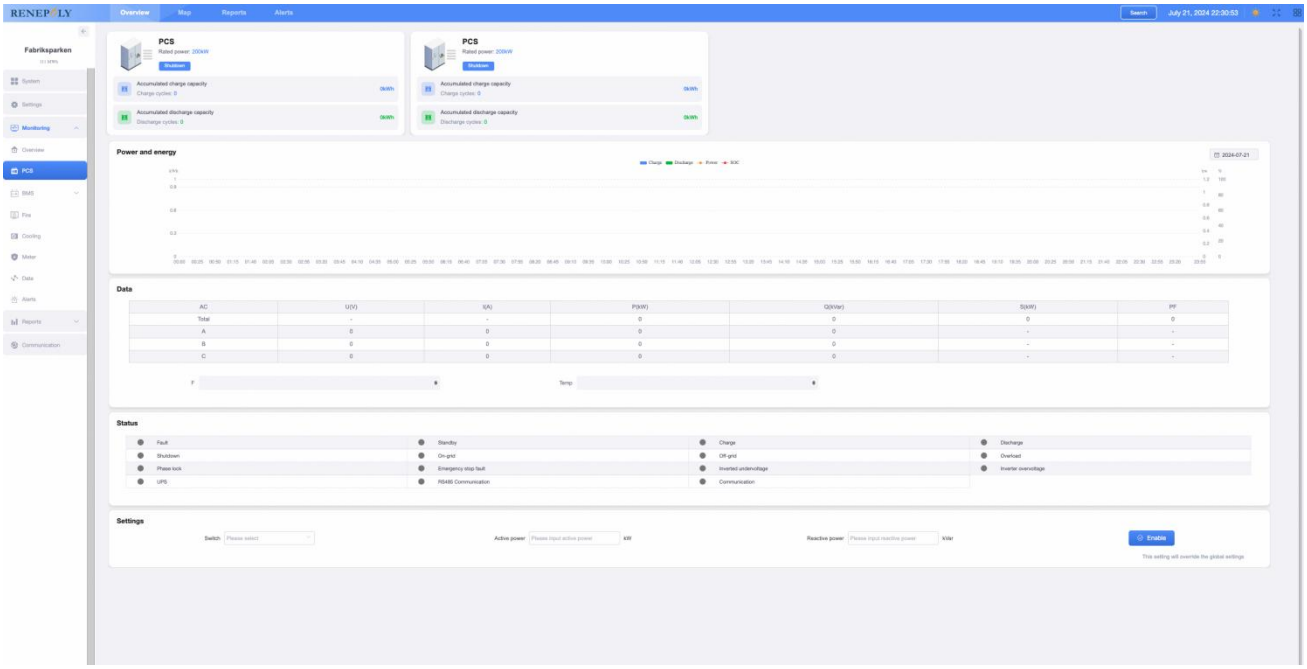
3. **Proxy mode:** In the proxy mode, the operation and maintenance personnel do not need to participate in the setting of the operation mode. The background program runs all the microgrid devices to achieve functions such as load balancing and energy exchange. The proxy mode can improve the flexibility and adaptability of the system and is suitable for complex energy management scenarios.

Through these three operation modes, the microgrid can achieve efficient, safe and flexible operation management under different application scenarios and requirements.ßß



Graphics and report pages:

Display equipment monitoring diagrams, operation reports, energy control, communication status, etc. through various texts, numbers, and icons. The background historical data can be displayed and reviewed in curves with hours as the horizontal axis and minutes as the interval. The historical storage time is greater than 1 year. The data is displayed in the form of reports to display the required data.



1.12 EMS Mobile APP

The main functions of Renepoly Cloud APP include: power plant overview, power plant monitoring, equipment monitoring, energy conservation and emission reduction, monthly/annual reports, event management and report management.

Main features:

1. Comprehensive data report, statistical analysis of daily power plant operation, master power generation efficiency of power plant.

2. Real-time equipment data display, accurate event alarm.

3. Multi-power station cloud supervision, fast access, stable and efficient.

4. Mobile app, keep track of power plant operation at any time.

1.12.1 Environment

The mobile APP supports phones with both IOS and Android operating systems.

1.12.2 APP Interface

Microgrid overview page:

This page displays the overall information of the current power station, including the power station name, power station operation status, grid connection time, detection information of various equipment in the power station (including PCS, BMS, battery cells, meters, loads, gas turbines, etc.), analog measurement (including equipment voltage, current, active power, reactive power, frequency, power factor) and other data information. The following shows the power station's self-generated and self-consumed electricity and grid-connected electricity, as well as the power curve of the power station on that day, including: photovoltaic power generation, load power consumption, energy storage charging power and energy storage discharging power, which can be used to observe the power station's operating trend on that day.

Photovoltaic energy storage details page:

The photovoltaic details page displays instantaneous radiation, daily/monthly/annual power generation, total power, fossil energy savings, cumulative carbon dioxide emission reduction and other data information. The power radiation curve of the power station on that day is displayed below. The energy storage details page displays the comprehensive efficiency, energy storage loss rate and SOC percentage of the power station. The power price, SOC rate, energy storage power and 10KV threshold table of the power station on that day are displayed below. The operation trend of the power station on that day can be observed, and the date can be switched to view.

Equipment monitoring page:

Click the device in the navigation bar to enter the equipment monitoring page, as shown in the figure below. This page displays the information of all equipment connected to the power station. Click the corresponding equipment to jump to the detailed monitoring page of this equipment as shown in the figure below, which displays all telemetry and telesignaling information of this equipment.

Event management, report page:

Click the event in the navigation bar to enter the event management page. This page displays the event information of the power station, including: normal, alarm, general fault and serious fault information. Click to enter the event to view the detailed information of the relevant event. Click the report in the navigation bar to enter the report management page, as shown in the figure below. The daily report on this page displays the indicator information of each day in the selected year and month, and the monthly report displays the power generation situation of each month in the selected year.

2 Hardware List

Depending on the use case, different hardware might be required. The compulsory onsite hardware is the local EMS Controller, which gathers signals from every equipment and sends operation commands.

No	Item	Description	Unit	Note
1	Industrial PC			Including local and cloud EMS software, no subscription fee
*2	EMS Controller			
3	Switch			
4	4G Industrial Router			
5	Outdoor cabinet			
6	UPS			
7	Air Conditioner			